DISSERTATION

Clinical and Psychosocial profile of Chronic abdominal pain in children aged 5 to 12 years in a tertiary centre

Submitted in fulfilment of requirements for the degree of

M.D. Paediatrics

BRANCH VII

THE TAMILNADU Dr. MGR MEDICAL UNIVERSITY

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INSTITUTE OF CHILD HEALTH AND HOSPITAL FOR CHILDREN

EGMORE, CHENNAI.

CERTIFICATE

This is to certify that the dissertation titled "**Clinical and Psychosocial profile of chronic abdominal pain in children aged 5 to 12 years in a tertiary centre**" submitted by **Dr.V.Suresh Kumar** to the Faculty of Paediatrics, The Tamil Nadu Dr.M.G.R. Medical University, Chennai, in partial fulfillment of the requirements for the award of M.D. Degree (Pediatrics) is a bonafide research work carried out by him under our direct supervision and guidance, during the academic year 2010-2012.

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This is submitted to the Tamilnadu Dr. M.G.R. Medical University, Chennai in partial fulfilment of the rules and regulations for the M.D. Degree Examinations in Paediatrics.

PLACE : CHENNAI

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CERTIFICATE OF APPROVAL

To
Dr. V. Suresh Kumar
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Dear Dr. V. Suresh Kumar

The Institutional Ethics Committee of Madras Medical College reviewed and discussed your application for approval of the proposal entitled "Clinical and Psychosocial Profile of chronic Abdominal Pain in Children Aged 5-12 years in Tertiary Centre" No. 02032011.

The Following Members of Ethics committee were present in the Meeting held on 17.03.2011 conducted at Madras Medical College, Chennai -3

1. Prof. S.K. Rajan MD	-- Chairperson
2. Prof. V. Kangasabai .MD Dean, Madras Medical College, Chennai -3	-- Deputy Chairman
3. Prof. A. Sundaram. MD Vice Principal, Madras Medical College, Chennai -3	-- Member Secretary
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9. Thiru. S. Govindasamy BA BL	-- Lawyer
10. Tmt. Arnold Saulina	-- Social Scientist

We approve the proposal to be conducted in its presented form.

Sd/ chairman & Other Members

The Institutional Ethics committee expects to be informed about the progress of the study and SAE occurring in the course of the study , any changes in the protocol and patient information / informed consent and asks to be provided a copy of the final report.

Member Secretary, Ethics Committee

CONTENTS

INTRODUCTION

Chronic abdominal pain is the commonest gastrointestinal complaint the physician or pediatrician is confronted with, in his outpatient clinic. The term chronic abdominal pain was derived from British pediatrician John Apley's pioneering study of 1000 school children in 1950 [1]. He defined abdominal pain as chronic or recurrent if at least one episode of pain occurs per month for three consecutive months and is severe enough to interfere with routine functioning.

The pain is classified as non-organic (functional) when there is no explainable cause. Early studies suggested 5 to 10% have organic causes [1, 2], but with the advent of advanced investigations, the incidence of organic abdominal pain is on the rise. Hyams in his work has reported 76 children having organic abdominal pain out of 227 children (33%) [3] studied.

Differentiating organic pain from non organic ones is often problematic resulting in management difficulties. Organic symptoms may have emotional components and vice versa. One of the main reasons for the reluctance to accept abdominal pain as psychosomatic disorder stems from the fear of overlooking serious organic illnesses by the mistaken belief that a definite emotional cause has to be found.

Epidemiology

In general, population based studies suggest that chronic abdominal pain is experienced by 10-12%[1] of school age children and almost 20% of middle-school and high-school students[4]. As children grow older, the incidence of chronic abdominal pain appears to rapidly decrease in boys but not so rapidly in girls [1]. The marked differences in data in different studies (0.3% to 20%) are due to choice of populations studied viz-hospitalized children, out patient clinics or school-based studies.

Boey and his colleagues studied chronic abdominal pain among school children in Malaysia and found a prevalence of 10.2% (urban 8.2 – 9.6%, rural 12.4%) [5]. Symptoms remit spontaneously in 30-50% of children and in about 50% of children can persist to adulthood as abdominal pain, migraine or irritable bowel syndrome [6]. A decade ago cohort studies from India documented a high prevalence (74%) of non-organic chronic abdominal pain [7]. IBS is probably the commonest cause (52%) of functional chronic abdominal pain among older children in the west [8].

CLASSIFICATION

In early 70s chronic abdominal pain was classified as organic (10%) and psychogenic (90%). However in 80s, a revised classification was adopted. Chronic abdominal pain was classified as organic (20%), dysfunctional (75%) and of psychiatric pathology (5%). Rome III (2006) divides Functional Gastro Intestinal Disorders in pediatrics into Type G for neonates and toddlers and Type H for older children and adolescents. Rome III classification reduces time duration to 2 months. The validity and reliability of Rome III criteria in diagnosing pediatric Functional Gastro Intestinal Disorders, however is yet to be fully validated, through it is clinically sound. One recent Sri Lankan study attempted this validation and found it to be useful[9].

PATHOGENESIS OF CHRONIC ABDOMINAL PAIN

Chronic abdominal pain results from a complex interaction between psychosocial and physiological factors via the brain-gut axis. It is also said that emotions, behavior, gut functions and abdominal pain are closely interrelated. Chronic abdominal pain results from

alteration in neurophysiologic functioning at the level of gut, spinal afferents, central autonomic relay system and brain.

Levine, et al in 1984 proposed a model where the presence or absence of pain was explained by an inter play of several environmental factors such as lifestyle and habits, temperament and learned responses, somatic predisposition and critical events in the child's life. All of the above could trigger cortical stimulation of increased gut activity and pain [10].

More recently the pathogenesis of chronic abdominal pain is well explained by the bio-psychosocial model [11]. Early life experiences, adult stressors (e.g., divorce or bereavement), lack of social support, and other social learning experiences affect both an individual's physiologic and psychological responses, including distress, psychiatric disorders, and beliefs and coping strategies. The gut responds to environmental and biological factors, but it also interacts directly with the brain, thereby providing 2-way interactions along the "brain-gut" axis. Genetic factors can have direct physiologic effects, and the genetic makeup of an individual can also make him or her more susceptible to environmental or social factors, thus leading to changes in physiology.

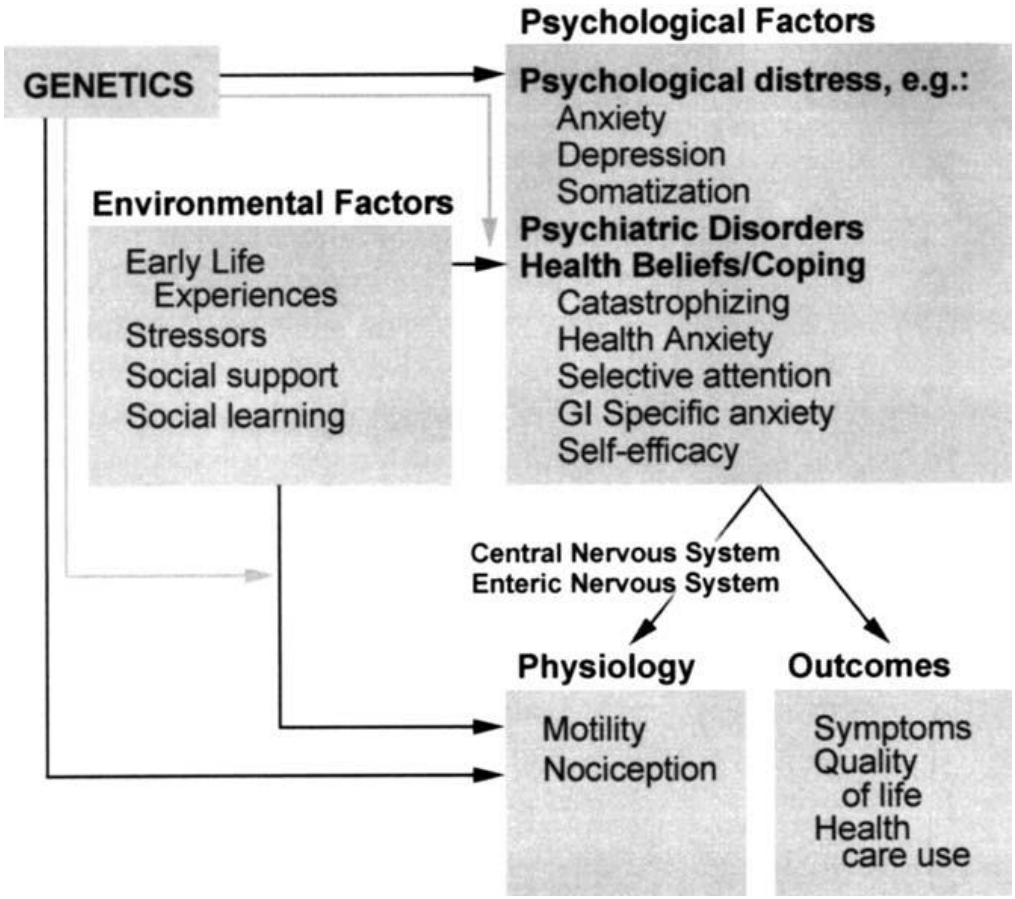

Fig.1 Biopsychosocial model

Genetic Predispositions

Genetic factors may play a role in several pathways, including lower levels of IL-10—an anti-inflammatory cytokine in some children with Irritable Bowel Syndrome that may affect gut mucosal neural sensitivity, serotonin reuptake transporter polymorphisms that can effect levels of 5-HT neurotransmitter [12], or the response to 5-HT blocking agents, g-protein polymorphisms that can affect both CNS and gut-related actions, and _2-adrenoreceptor polymorphisms [13] that affect motility.

Early Family Environment

The aggregation of chronic abdominal pain in families is not only genetic. What children learn from parents may contribute to the risk of developing chronic abdominal pain [14].

Psychosocial Factors

High frequency rates of sexual, physical, and emotional abuse in patients with chronic abdominal pain (30%–56%) [15] have been reported. Stressful life events are associated with symptom exacerbation among adults, children with chronic abdominal pain and are also associated with frequent health care seeking by patients with chronic abdominal pain [16].

Children with chronic abdominal pain also have higher levels of anxiety and depression than healthy children, and the levels of anxiety and depression are often related to the duration of symptoms in these children.[17] Depressed children with recurrent abdominal pain report numerous bodily symptoms, in response to daily stressors, suggesting that stress reactivity is important in these children[18].

Environmental stressors and related changes in mood alter the function of the gastrointestinal tract and gastrointestinal symptom perception in persons with chronic abdominal pain. The relationship of

stressors to gastrointestinal function is viewed as a direct consequence of the bidirectional modulation of gastrointestinal function by the central nervous system, including motor responses, pain modulation, and even immune function. [19] These interactive relationships are important for chronic abdominal pain in that they provide the foundation for the hypotheses of central nervous system dysregulation as causative in gastrointestinal symptom onset and maintenance [11]. Activation of central nervous system circuits that include the emotional motor system lead to neuroendocrine responses such as the release of corticotrophin- releasing factor, cortisol, and nor epinephrine and epinephrine.

It is well recognized that children with chronic abdominal pain experience considerable impairment in health-related quality of life. [20] Psychosocial factors have a major and unique negative impact on health-related quality of life that can be reversible with appropriate psychological intervention [21]. These children have high health care seeking attitude which may be reduced following psychological treatment[22].

A number of social learning phenomena can influence the clinical expression of abdominal pain, including modeling (i.e., where children observe and learn to display the illness behavior of their

parents and significant others) and positive reinforcement. Retrospective and prospective studies have shown that children whose mothers reinforce illness behaviors experience more severe stomachaches and miss more school days than other children.[23] It has been shown that when parents of children with chronic abdominal pain are taught to reduce positive or sympathetic responses to their children's reports of pain, the frequency of these complaints decreases.[24]

Abnormal Motility

Strong emotion or environmental stress can lead to increased motility in the esophagus, stomach, small intestine, and colon. The children with chronic abdominal pain are characterized by even greater motility response to stressors when compared to normal subjects [25].

Visceral Hypersensitivity

Children with chronic abdominal pain have a lower pain threshold with balloon distension of the bowel (visceral hyperalgesia), or they have increased sensitivity even to normal intestinal function (e.g., allodynia), and there may be an increased area of somatic referral to visceral pain. Visceral hypersensitivity may be amplified in

children with chronic abdominal pain, a process called sensitization or stimulus hyperalgesia.

Hypersensitivity and sensitization may occur through altered receptor sensitivity at the gut mucosa and myenteric plexus, which may be enabled by mucosal inflammation, degranulation of mast cells close to enteric nerves, or increased serotonin activity, possibly enhanced by alteration of the bacterial environment or infection. There may also be increased excitability via central sensitization and possibly growth of the spinal cord dorsal horn neurons due to chronic or repetitive visceral stimulation, thus amplifying throughput to the CNS. Finally, there may be altered central down regulation of visceral afferent transmission, thus reducing pain [19].

Inflammation

It is likely that mucosal inflammation may, at least in part, be a determinant of visceral hypersensitivity and sensitization. [26]

Bacterial Flora

The improvement in Irritable Bowel Syndrome symptoms in response to Bifidobacter infantis was associated with alteration of IL-10/IL-12 ratios, thus converting a more inflammatory cytokine environment seen in Irritable Bowel Syndrome to a more normal setting as seen in healthy individuals [27].

Brain-Gut Interactions via the CNS-ENS

Bidirectional "hardwiring" of brain-gut axis. The brain-gut axis allows bi-directional input and thus links emotional and cognitive centers of the brain with peripheral functioning of the gastrointestinal tract and vice versa. So, extrinsic (vision, smell, etc) or enteroceptive (emotion, thought) information has, by nature of its neural connections from higher centers, has the ability to affect gastrointestinal sensation, motility, secretion, and inflammation. Conversely, viscerotopic effects (e.g., visceral afferent communications to the brain) reciprocally affect central pain perception, mood, and behavior [28].

Brain imaging

There is an association of anterior cingulate cortex (ACC) activation to rectal distension in Irritable Bowel Syndrome relative to controls [29]. It correlates with anxiety, stressful life events, maladaptive coping and a history of abuse.).

Brain-gut peptides

Putative agents include primarily 5-HT and its congeners, the enkephalins and opioid agonists, substance P, calcitonin gene-related polypeptide, and cholecystokinin, neurokinin receptor, and

corticotrophin-releasing hormone antagonists among others. These neuropeptides have integrated activities on gastrointestinal function and human behavior depending upon their location.

Chronic abdominal pain Functional:

Typical pain pattern in functional pain is paroxysmal, with variable severity and clustering of pain, gradual in onset, usually peri-umbilical, occasionally epigastic with poor relationship to food, defecation. Children are often unable to clearly describe nature or location of the pain.

Recently functional abdominal pain has been classified according to Rome III Criteria [30] as follows.

Abdominal pain-related Functional Gastrointestinal Disorders

1. Functional dyspepsia
2. Irritable bowel syndrome
3. Abdominal migraine
4. Childhood functional abdominal pain
5. Childhood functional abdominal pain syndrome.

Diagnostic criteria for functional dyspepsia

Persistent or recurrent pain or discomfort centered in the upper abdomen (above the umbilicus)

1. Not relieved by defecation or associated with the onset of a change in stool frequency or stool form (i.e., not IBS)
2. No evidence of an inflammatory, anatomic, metabolic, or neoplastic process that explains the subject's symptoms

   *Criteria fulfilled at least once a week for at least 2 months before diagnosis.

Diagnostic criteria for irritable bowel syndrome

Abdominal discomfort (an uncomfortable sensation not described as pain) or pain associated with 2 or more of the following at least 25% of the time.

a. Improved with defecation
b. Onset associated with a change in frequency of stool
c. Onset associated with a change in form (appearance) of stool

1. No evidence of an inflammatory, anatomic, metabolic, or neoplastic process that explains the subject's symptoms

   *Criteria fulfilled at least once a week for at least 2 months before diagnosis.

Diagnostic criteria for abdominal migraine

1. Paroxysmal episodes of intense, acute periumbilical pain that lasts for 1 hour or more
2. Intervening periods of usual health lasting weeks to months
3. The pain interferes with normal activities
4. The pain is associated with 2 or more of the following:
    a. Anorexia
    b. Nausea
    c. Vomiting
    d. Headache
    e. Photophobia
    f. Pallor
5. No evidence of an inflammatory, anatomic, metabolic, or neoplastic process considered that explains the subject's symptoms

    *Criteria fulfilled 2 or more times in the preceding 12 months.

Diagnostic criteria for childhood functional abdominal pain

1. Episodic or continuous abdominal pain
2. Insufficient criteria for other Functional Gastrointestinal Disorders
3. No evidence of an inflammatory, anatomic, metabolic, or neoplastic process that explains the subject's symptoms

   *Criteria fulfilled at least once a week for at least 2 months before diagnosis.

Diagnostic criteria for childhood functional abdominal pain syndrome

1. Some loss of daily functioning
2. Additional somatic symptoms such as headache, limb pain, or difficulty sleeping

   *Criteria fulfilled at least once a week for at least 2 months before diagnosis.

Chronic abdominal pain Organic:

Typical pain pattern in organic chronic abdominal pain is a clearly localized pain (away from the umbilicus), radiating pain, well-defined pain (burning, stabbing, etc), and pain awakening the child at night.

One should meticulously look for the presence of red flag signs of organic cause which include unexplained weight loss, pain with fever, tenderness, organomegaly, blood in stools (occult and obvious), altered bowel movements, family history of Inflammatory bowel disease, anemia, urinary symptoms, elevated erythrocyte sedimentation rate/C-reactive protein, arthralgia, rash and purpura.

Causes of Chronic abdominal pain organic

Gastrointestinal

Esophageal: Gastro-esophageal reflux disease, oesophagitis (viral, pill, Candida)

Stomach: Peptic ulcer, H. pylori gastritis, bezoars

Intestinal: Giardiasis, amoebiasis, helminthiasis, tuberculosis, inflammatory bowel disease (ulcerative colitis, Crohn disease), lactose intolerance, celiac disease

Surgical: Malrotation with or without volvulus, intussusceptions, postsurgical adhesions, small bowel Iymphoma.

Hepatobiliary: Choledochal cyst, cholelithiasis, choledocholithiasis, space-occupying lesions.

Pancreas: Pancreatitis.

Non-gastrointestinal

Renal: Urinary tract infection, obstructive uropathy

Pelvic: Pelvic inflammatory disease, ovarian pathology

Haematological: Leukemia

Vascular: Henoch-Schonlein purpura, polyarteritis nodosa

Metabolic: Diabetic Ketoacidosis, porphyria, lead poisoning

Stepwise approach to Chronic abdominal pain

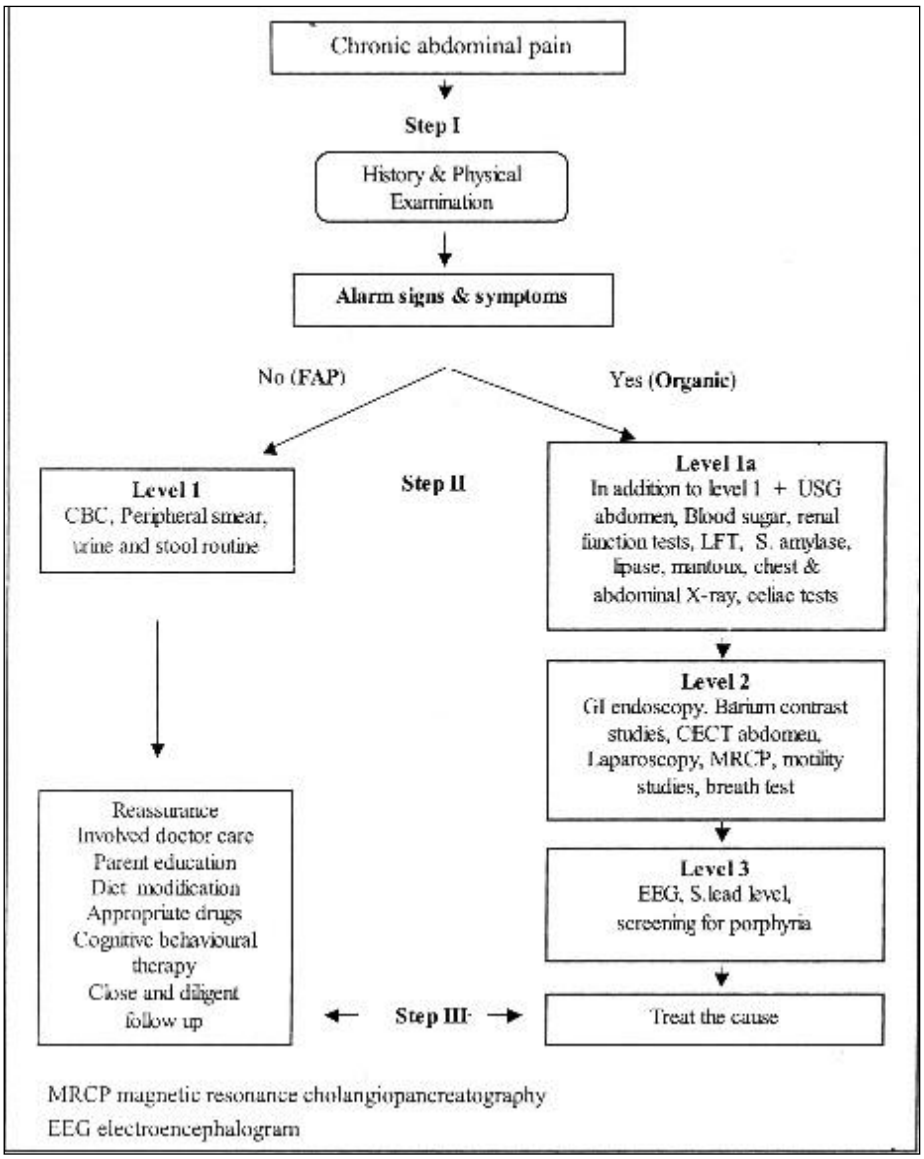

Fig.2 Stepwise approach to Chronic abdominal pain[10]

Management:

- In the initial assessment, the physician has 3 tasks:
    1. Develop a satisfactory physician-child relationship.
    2. Make a positive diagnosis of Chronic abdominal pain.
    3. Identify any "red flag" indication that may indicate a psychological management strategy.
- Facilitate the children's and parents understanding of the disorder. Aim to normalize lifestyle, school attendance and performance, normal sleep and growth.
- Recommend symptomatic medical therapies and/or simple behavioral/lifestyle changes. Medical therapies refer to strategy such as dietary manipulation, prokinetics, H2 blockers or proton pump inhibitors in documented Acid peptic disease, laxatives, bulking agents, antidiarrheals, and antispasmodics. Enteric coated peppermint oil has found to be useful in Irritable Bowel Syndrome. Abdominal migraine may benefit from pizotifen, propranolol, and cyprohepatidine. Preferred behavioral/lifestyle changes may be determined by assessing situations in which the children's symptoms deteriorate or improve. Alosetron(5HT3 antagonist) and Tegaserod(5HT4 agonist) can be used in

diarrhea predominant Irritable Bowel Syndrome and constipation predominant Irritable Bowel Syndrome respectively[10,11]

- Select psychopharmacological medication or more specific psychological management.

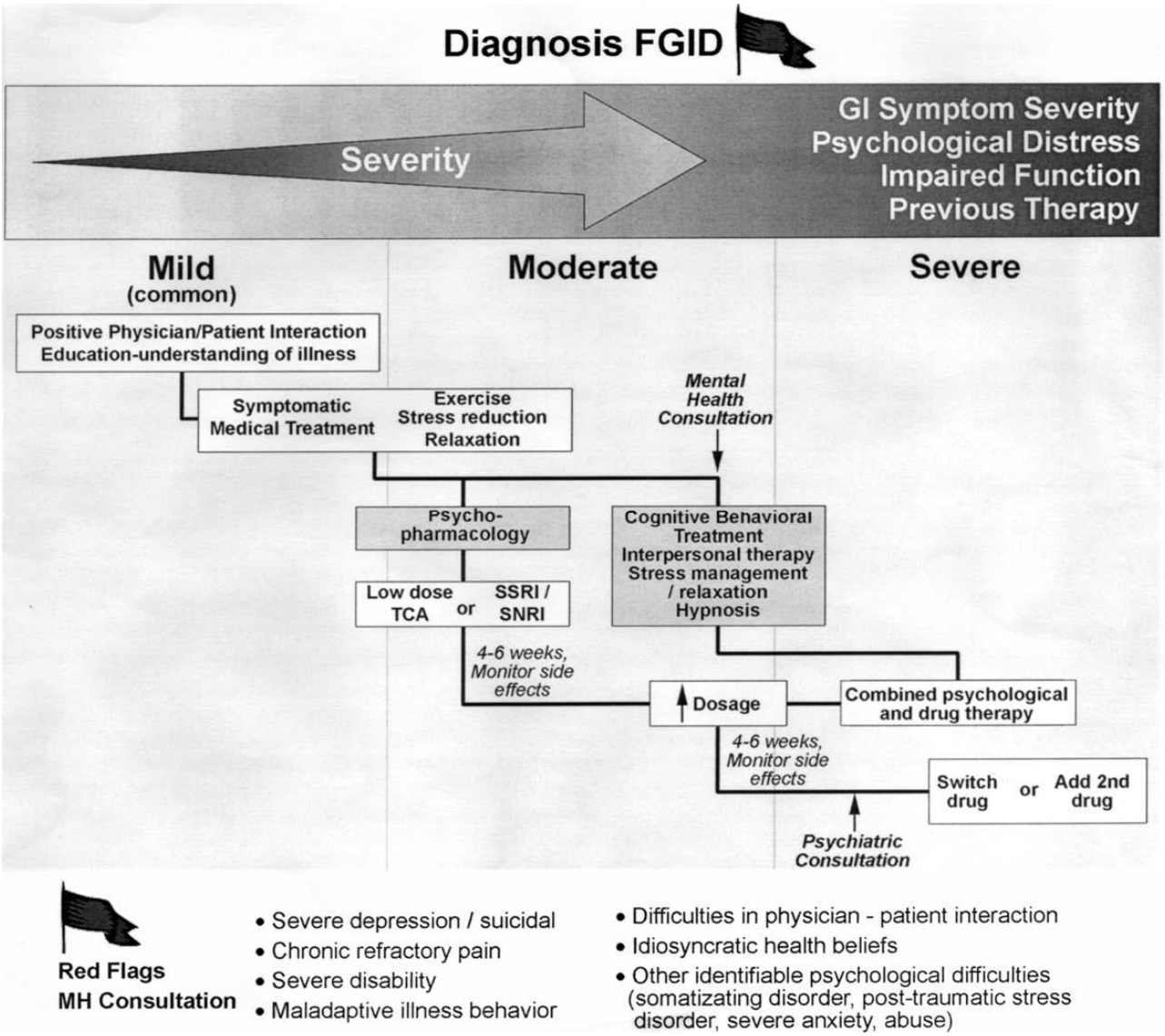

Fig.3 Step wise management of functional abdominal pain[11]

- Consider adding the second form of treatment (psychopharmacological or lifestyle/behavioral) to the first. There is evidence in favor of such combined treatment in several disorders[31].There are also good theoretical grounds for combined treatment in children with Chronic abdominal pain , because antidepressants have some direct action on pain , anxiety, and depression and can increase the children's motivation to engage in therapy. Psychological treatments are effective in modifying health anxiety, selective attention, catastrophizing, and aspects of poor coping and can also increase adherence to psychopharmacological treatment[11].

Cognitive-Behavioral Therapy

The theoretical basis of cognitive-behavioral therapy lies in social learning, which includes the concept that behavior is shaped by its consequences. Cognitive behavioral therapy recognizes that social consequences produced in the environment may influence cognitions, motor behavior, and physiological responses; in turn, how individuals respond may influence the reaction they get from their environment.

Thus, cognitive behavioral therapy interventions address the thoughts, behaviors, and responses that result from children' daily interactions. Relaxation/stress management is often incorporated into Cognitive Behavioral Therapy because of its effect in reducing autonomic arousal and anxiety[32].It improves pain coping attitude in children with Chronic abdominal pain leading to significantly more pain-free days compared with standard medical care or symptom monitoring.

Relaxation Training

Relaxation or arousal reduction techniques (including progressive muscle relaxation, biofeedback, autogenic training, and meditation) teach children to counteract the physiological sequelae of stress or anxiety and may lead to a significant reduction in gastrointestinal symptoms [33].

Dynamic Psychotherapy

This form of therapy (similar to brief interpersonal psychotherapy) requires a close relationship between the children and the therapist, in which the child can learn how he or she responds in such a relationship and this treatment is cost effective [34].

Hypnotherapy

Hypnotherapy is useful in Irritable Bowel Syndrome and functional dyspepsia and this can be an effective treatment, with benefits that persist over time[35].

Pharmacological Treatment

In addition to the effect on anxiety and depression described previously, antidepressants have direct analgesic effects that are useful in treating children with chronic abdominal pain.

Antidepressants

Tricyclic antidepressants produce benefit for children with moderate to severe Irritable Bowel Syndrome [36], provided the children adhere to the prescribed medications. They are currently the favored antidepressant for treating children with IBS based on the available literature. The evidence for SSRIs is more equivocal [37], possibly without the noradrenergic effect of the tricyclic antidepressants there is theoretically less benefit for pain, although the effect in reducing central anxiety may have secondary effects on global well-being. . The serotonin-nor epinephrine reuptake inhibitors (SNRIs) are a relatively new class of antidepressants that have substantial serotonergic and

noradrenergic effects (unlike the SSRIs) to reduce pain but without the antihistaminic and anticholinergic effects of the tricyclic antidepressants that lead to most of the side effects[38].

Anxiolytics

Anxiolytic agents can be used in children with Functional Gastrointestinal Disorders, especially when there are co morbid generalized anxiety and panic disorders. A newer class of antianxiety agents, the azapirones (e.g., buspirone), which act by serotonin agonist activity at presynaptic 5-HT1A receptors, may be more useful because they potentiate the action of antidepressants, are well tolerated and have no addictive potential [11].

REVIEW OF LITERATURE

In a study done by **S.Dutta, M.Metha, IC.Verma** revealed 74% functional cause and 26% organic cause. Organic cause reported were peptic ulcer, intestinal parasites, urinary tract infection and vesico-urethral reflux. They reported higher prevalence of marital discord, maternal dysmenorrhea, irritable bowel syndrome, chronic painful disorder and chronic abdominal pain. Tantrum before going to school, absenteeism and punishments meted out at school were more common in the functional group. There was no difference with respect to birth order, sibling rivalry, sibling domination, academic achievements and non painful disorders [7].

In a study done by **John V. Campo, MD; Jeff Bridge, PhD; Carlo Di Lorenzo, MD**; showed that RAP children were significantly more likely to receive a diagnosis of a psychiatric disorder, with a categorical anxiety disorder in 33 (79%) and a depressive disorder in 18 children (43%), and higher levels of anxiety and depressive symptoms, temperamental harm avoidance, and functional impairment than control subjects. Anxiety disorders (mean age of onset: 6.25 [standard deviation: 2.17] years) were significantly more likely to

precede RAP (mean age of onset: 9.17 [standard deviation: 2.75] years) in anxious children [39].

Jacob Oster M.D et al, have published an eight year long longitudinal study in 1969 on school children showing the incidence of chronic abdominal pain to be maximum at nine years of age, girls were than more affected than boys [40].

A field survey of thousand school children by **John Apley et al** in 1956 showed 10.8% had chronic abdominal pain fulfilling his criteria. Girls were more affected than boys. Peak age of incidence was 14 years for boys and 9 years for Girls. In two third of children, pain was periumbilical [1].

Niyaz et al from Srinagar in 2002 conducted a study on 85 children with chronic abdominal pain out of which 15 cases were organic and 70 were functional in nature. Giardiasis was the commonest organic cause followed by Gallstones, Urinary tract infection, oesophagitis/gastritis and abdominal tuberculosis. Single parent, school phobia, sibling rivalry, chronic abdominal pain in other family members and nocturnal enuresis were associated with non organic abdominal pain [41].

In a study done by **Walker and Lynn** it was reported that chronic abdominal pain children experienced more frequent daily stressors than well children both at home and school. Idiographic analysis indicated that the association between daily stressors and somatic symptoms was significantly stronger for children with chronic abdominal pain than well children [42].

According to a study done by **Ellen crush ell M.D and Masion Rowland M.D** acceptance by the parents of a biopsychosocial model of illness is important for resolution of chronic abdominal pain in children [43].

In a study done by **Wall-El-Matary** it was reported that among children presenting with chronic abdominal pain in hospital setting, 30% have diagnosable organic etiology and irritable bowel syndrome is commonest cause of chronic abdominal pain [44].

According to a study done by **Walker and Lynn** children who were low in social competence, higher level of negative life events predicted higher level of somatic complaints and children whose father and mother were characterized by high level of somatic symptoms had higher level of somatic complaints[45].

In a study done by **John V. Campo, MD; Carlo Di Lorenzo, MD** it was shown that there is a strong and relatively specific association between childhood chronic abdominal pain and anxiety in young adulthood. There were trends suggesting association between childhood chronic abdominal pain and lifetime psychiatric disorder, depression, migraine and family history of depression [46].

According to a study done by **Vicki Wilson starrer and Nancy M.Ryan wenger** children with chronic abdominal pain had high stress scores and lower mean coping scores. Prevention and treatment of psychosomatic symptoms requires changing the stressor or changing the methods that children use to cope with stressors that cannot be changed [47].

In a study done by **Dr.Garber and Ms.Zeman** it was concluded that both groups of organic and non organic chronic abdominal pain had significantly more anxiety and depression than healthy group. Children with non organic chronic abdominal pain had significantly high CBCL internalizing score. Mothers of Chronic abdominal pain were significantly more anxious than other mothers [48].

In a study of 111 children with chronic abdominal pain, **R.G.Bury** concluded that simple psychosomatic approach showed an immediate and sustained improvement in symptoms [49].

In a study done by **Smitha LS Haldera** it was concluded that in subjects free of abdominal pain psychological distress, health anxiety and illness behavior or predictors of future onset of chronic abdominal pain [50].

According to a study done by **Nader N Youssef M.D** children with functional abdominal pain had lower quality of life scores and parents perception of quality of life for children with functional abdominal pain were lower than children's self reported scores[51].

In a study done by **M.Liakopoulou-Karis** it was concluded that in children with chronic abdominal pain 81.6% carried a psychiatric diagnosis, primarily anxiety and depression in contrast to 15% of controls [52].

STUDY JUSTIFICATION

Chronic abdominal pain is a common problem in pediatric outpatients, requiring extensive work up, involving manpower and laboratory resources to find out any organic cause. However most of the time no abnormality is detected, further studies point to psychological problems or difficulties in child environment. So, taking up a study which focuses on psychosocial issues of children with chronic abdominal pain may throw light on etiology of this disorder and inputs for management. This in turn will help the child return to premorbid productive life as early as possible.

A study done in All India Institute Medical Sciences has studied the home and school environments,, however structured psychological assessment using standardized scales was not done and the prevalence of anxiety and depression not studied. Studies showing the prevalence of these disorders in our set up are lacking and hence this study is undertaken.

AIM OF THE STUDY

- To study the psychosocial factors in chronic abdominal pain in children aged 5-12 years in a tertiary referral centre.

- To study the prevalence of anxiety and depression in chronic abdominal pain in children aged 5-12 years in a tertiary referral centre.

SUBJECTS AND METHODS

Study Design	-	Case control study
Study Time	-	Dec.2010 – Oct.2011
Place of Study	-	Dept. of Gastroenterology, Institute of Child Health. Child Guidance Clinic, Institute of Child Health. Pediatric medical and surgical outpatient departments, Institute of Child Health.
Study population	-	Children aged 5 to 12 years with chronic abdominal pain
Case definition	-	Any child aged 5 to 12 years with abdominal pain presenting continuously or occurring in a weekly for a minimum period of two months (Rome III Criteria)

Case Inclusion Criteria	-	All children aged 5 to 12 yrs with chronic abdominal pain satisfying the above definition
Case exclusion criteria	-	Children with any chronic physical or psychiatric disease,Mental retardation.
Control Inclusion Criteria	-	Healthy pain free children in the same age group matched for age and sex and demography
Control exclusion Criteria	-	Children with chronic physical or mental illness
Sample size	-	Sample size was calculated based on previous study[39] incidence and based on it the sample size needed for the study was 70 per group.
Ethics	-	Informed consent was obtained from parents before enrolling their child into the study. Institutional review board clearance was obtained.

Methodology:

All children aged 5 to 12 years with chronic abdominal pain as per the above criteria attending the pediatric medicine and pediatric surgery outpatient departments were enrolled in pediatric gastroenterology out-children department after parental consent. Following a detailed history and physical examination, children were subjected to baseline investigations like complete blood count, urine routine and culture examination, stool routine examination, ultra sound abdomen and pelvis, X-ray chest, mantoux, liver function test, serum amylase. Upper oesophagogastroduoduenal endoscopy was done in all the children and barium study was done when required.

Children in the case group were divided into two groups namely chronic abdominal pain-organic and chronic abdominal pain-nonorganic.

Only those children who satisfied all the three criteria were classified as chronic abdominal pain-organic:

1. An organic cause was demonstrated
2. There was clinical and laboratory response to treatment.
3. There was sustained clinical remission after treatment for at least three months.

The children who did not satisfy the above criteria were considered to have chronic abdominal pain-non organic[7]. Both groups were subjected to structured psychosocial assessment. Control group was selected from healthy children with no pain and were subjected to the same psychosocial assessment.

Psychosocial assessment includes questionnaire for assessing family and child factors and pediatric symptom checklist-17, Spence children anxiety scale and child depression rating scale. Scales used in the study were validated scales with good psychometric properties. Psychosocial assessment was done by a psychiatrist who was not aware of the status of abdominal pain.

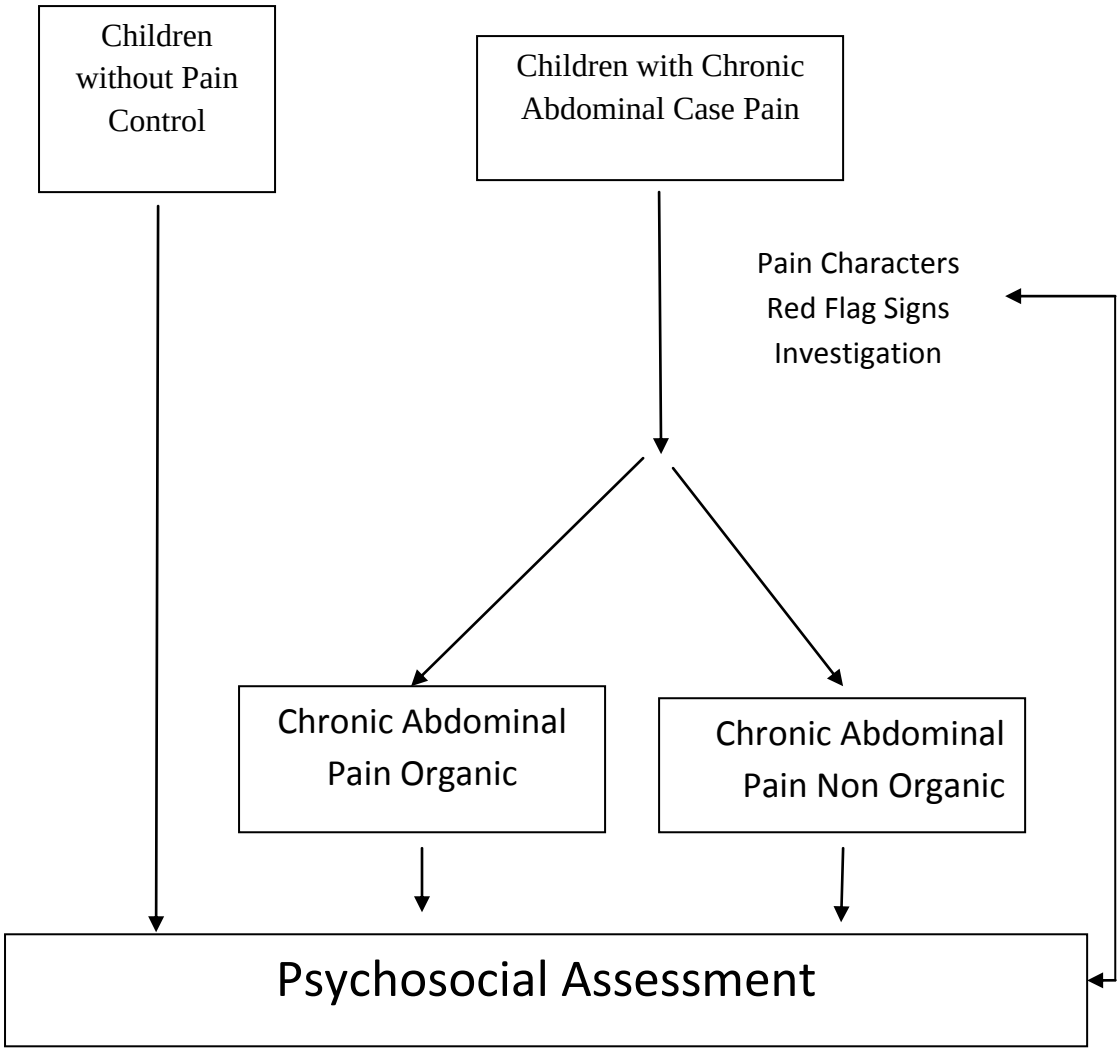

Fig.4 Study design

Result

Data were compiled and analsyed using SPSS software 16.0 version. We compared the proportion of organic, nonorganic and control using CHISQUARE test,T-test and ANOVA.We also used MULTIPLE LOGISTIC REGRESSION ANALYSIS to see the significant difference between the associated factors.

Results:

Seventy children satisfied selection criteria of which 13 (18.5%) were identified to be suffering from organic causes. Rests of the 57 (81.5%) children were diagnosed to have nor organic or functional cause. The details of diagnosis are presented below.

Chronic abdominal pain- non Organic:

25 out of 57 children (44%) were diagnosed as functional abdominal pain and 16 (28%) were diagnosed as functional abdominal pain syndrome and 8 children (14%) were diagnosed as functional dyspepsia and irritable bowel syndrome each.

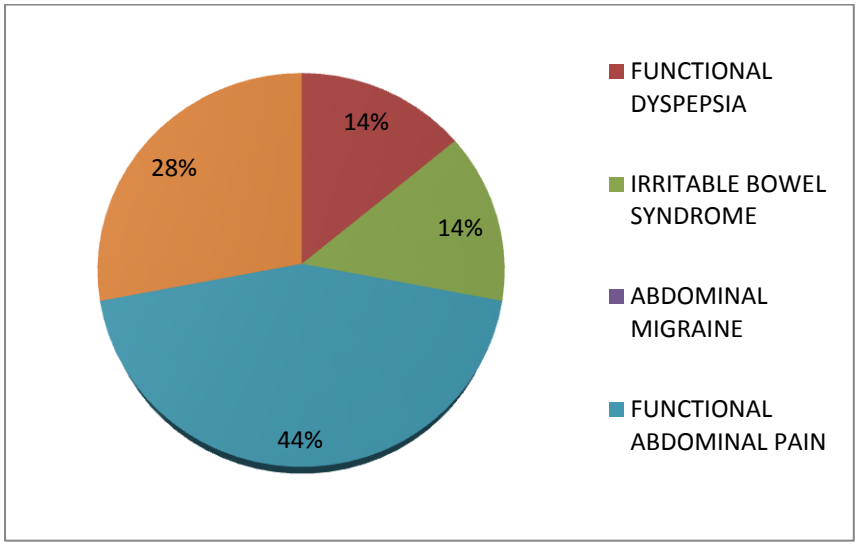

Fig. 5 Subtypes of chronic abdominal pain non- organic

Chronic abdominal pain- Organic:

4 out of 13 children (31.1%) were diagnosed as chronic pancreatitis, and 2 children (15%) were diagnosed as abdominal tuberculosis and ulcer dyspepsia each. Four children were Henoch scholen purpura, urinary tract infection, inflammatory bowel disease and peptic ulcer each.

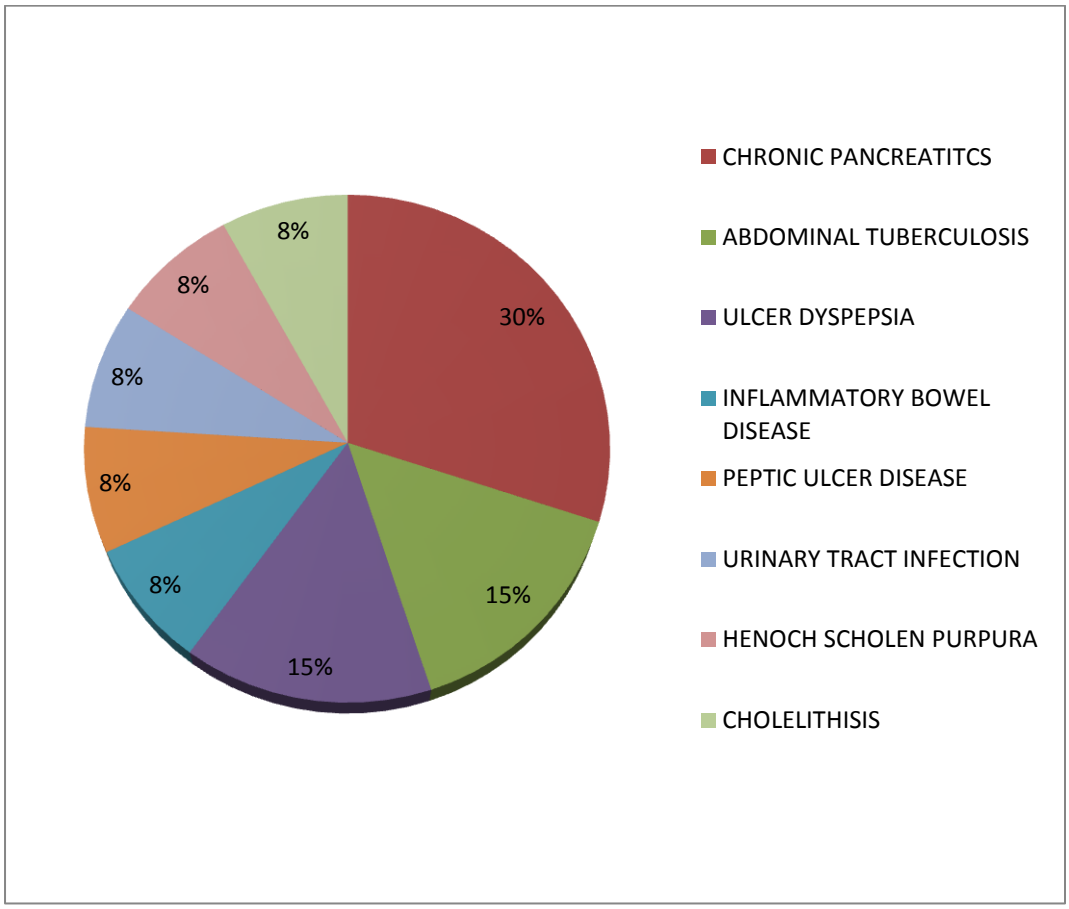

Fig. 6 Chronic abdominal pain-organic aetiology

Demography:

S.No	AGE GROUP	NON ORGANIC		ORGANIC	
		Male NO (%)	Female NO (%)	Male NO (%)	Female NO (%)
1	5-8 YEARS	9(11)	5(10)	1(8)	0
2	9-12 YEARS	20 (37)	20 (37)	4 (31)	8 (61)

Table 1: Showing Age and Gender distribution

Nearly two-third of children with chronic abdominal pain in the non organic group and 90% of chronic abdominal pain in the organic were more than 8yrs of age. In age group less than 8yrs there was a male preponderance and in children more than 8yrs sex distribution was equal. The mean age of non organic group was 9.61(SD- 1.934), mean age of organic group was 10.31 (SD– 1.494) and mean age of control group was 10.04 (SD– 1.605)

Most of the children in all the three groups were from urban areas studying in state board schools. Most of the parents belong to lower socio economic status as reflected by education and occupation.

S.No	Factor	Case non organic (n=57) No (%)	Case organic (n=13) No (%)	Control (n=72) No (%)
1	Location urban	44 (77)	9 (69)	56 (78)
2	Education type State board/Matric	56 (98)	13(100)	72 (100)
3	Education of Father primary schooling	32 (56)	10(77)	62 (86)
4	Occupation of Father labor	49 (86)	11(85)	66 (92)
5	Education of Mother primary schooling	35 (62)	11 (85)	64 (89)
6	Occupation of Mother housewife	52 (91)	11 (85)	69 (96)

Table 2: Showing demographic distribution

The demographic data of all three group namely chronic abdominal pain-non organic, chronic abdominal pain- organic, and control were similar.

There were no significant differences noted with respect to, sex, location, education, parental education and occupation

Pain characters:

Chronic abdominal pain- non organic:

39 children (69%) of chronic abdominal pain- non organic group reported pain around umbilicus and 34 children (60%) reported dull pain and in 55 children (96.5%) pain was intermittent. 79% of non organic children returned to normal in between the episodes and there was an association with other pain like headache and limb pain in 36% and school abstinence was noted in 54% of children belonging to the non organic group.

Chronic abdominal pain- organic:

7 children (54%) reported pain away from the umbilicus signifying Apley's criteria. 10 children (77%) reported pain to be of specific character and in 8 (62%) of children did not have normalcy in between the episodes .

S.No	Site of pain	Non Organic	Organic
1	Pain around umbilicus	68	46
2	Pain away from umbilicus	32	54

Table 3:Showing pain site distribution
Significant (P value < 0.5)

S.No	Pain Character	Non Organic	Organic
1	Dull Pain	60	23
2	Specific Pain	40	77

Table 4:Showing pain character distribution
Significant (P value < 0.5)

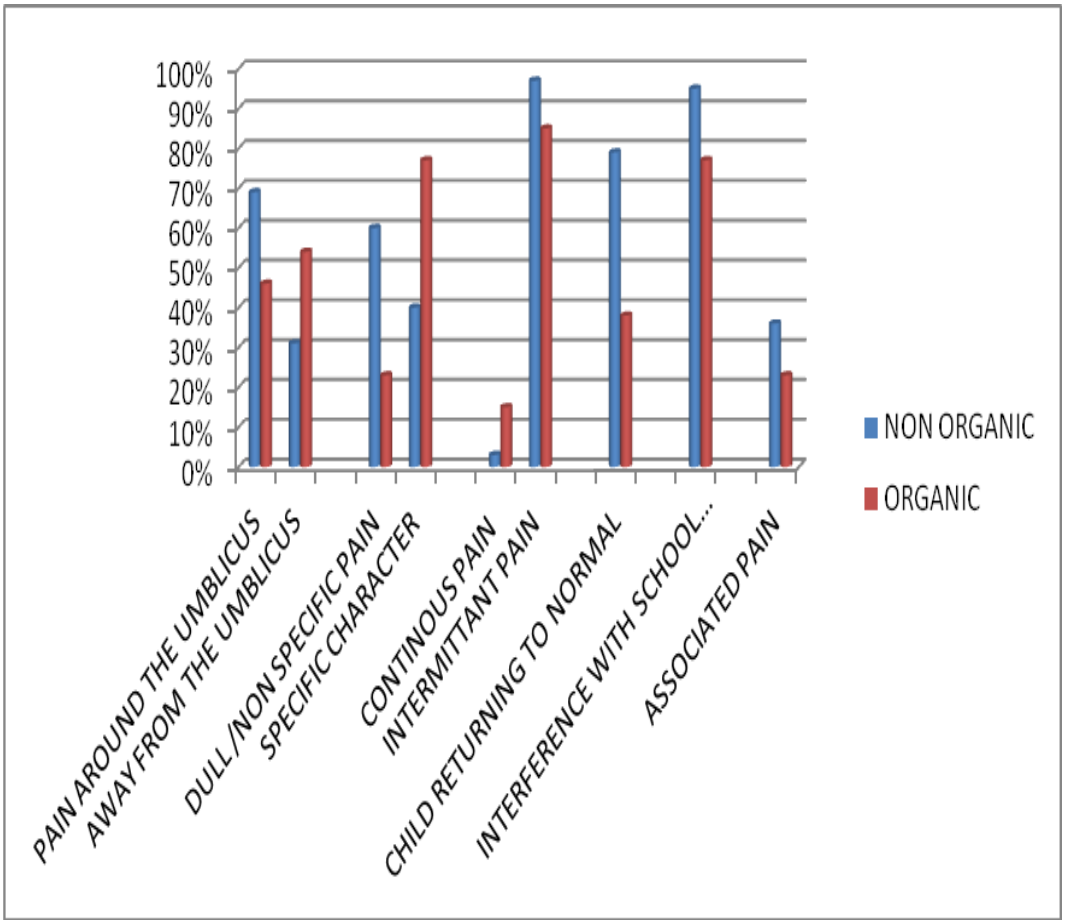

Fig 7: Showing pain character distribution

Red flag signs:

Pain that wakes the child from sleep (nocturnal pain) was noted in 10 (77%) children with organic abdominal pain and one third of children with chronic abdominal pain organic had objective weight loss and one fourth of them had short stature.

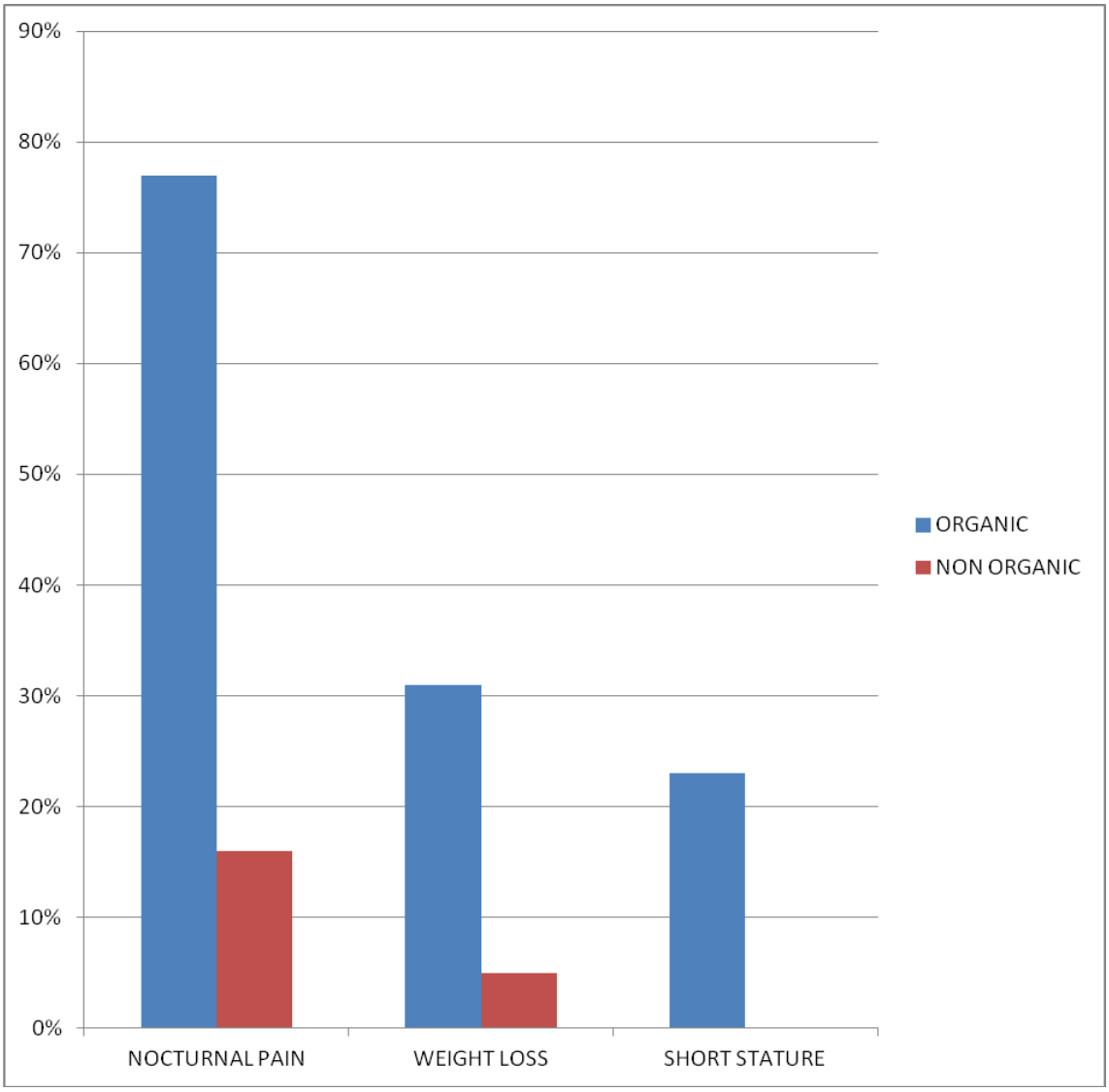

Fig. 8 Showing the distribution of significant red flag signs

Psychosocial factors:

3 children with chronic abdominal pain- non organic group had only one biological parent, significant illness proceeding one year was noted in 6 (10.5%), death in the family in the last one year was noted in 9 (16%) , chronic abdominal pain in family was noted in 10 (18%) , frequent quarrelling in the family (marital discord) was noted in 26 (46%), family separation was reported in 2 children, psychiatric treatment in family was noted in 2 , magical/religious treatment in family was noted in 6 (11%), alcohol dependence was noted in 28 (49%) and tobacco dependence was noted in 15 (26%) children belonging to non organic group .

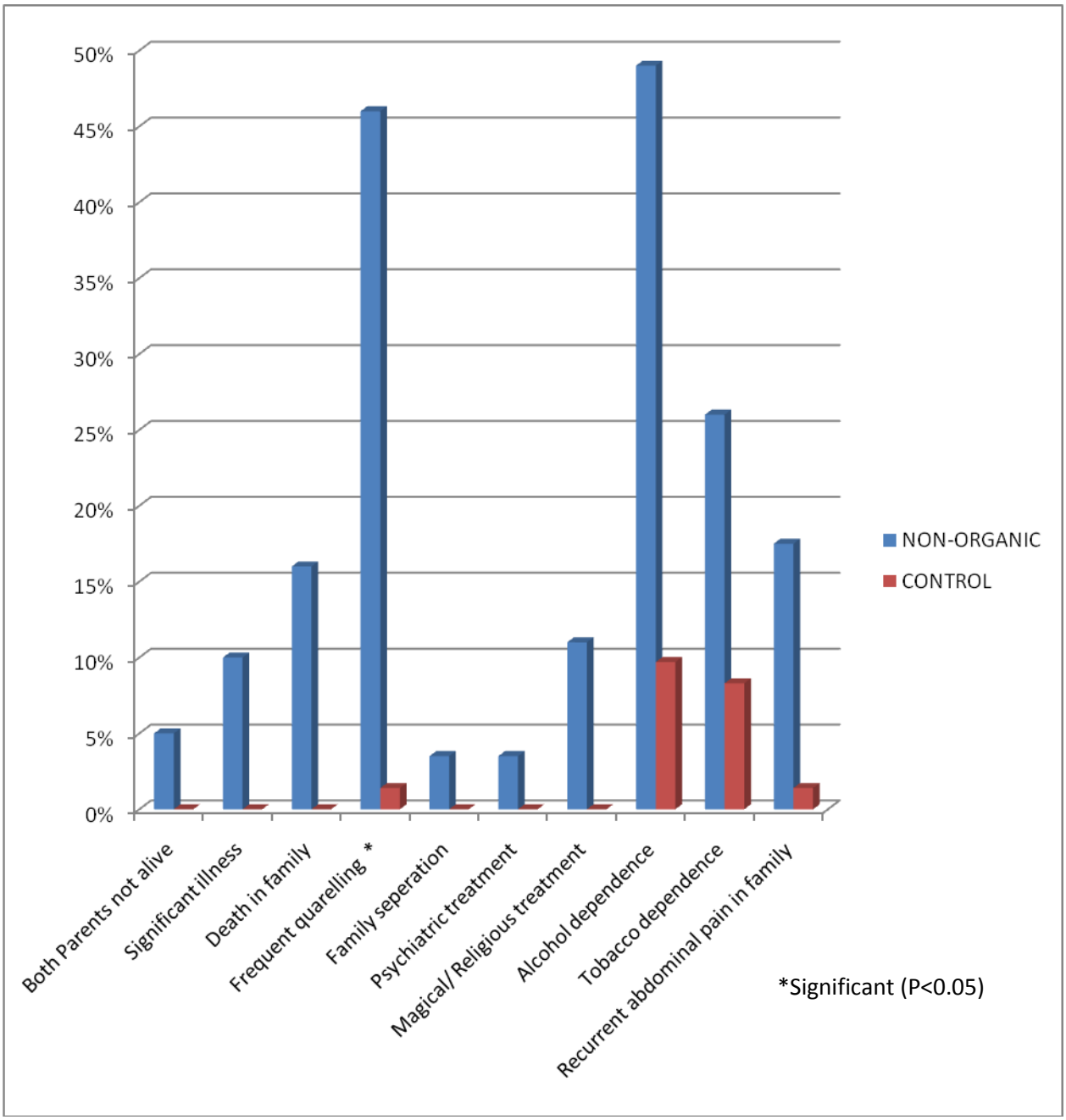

Fig. 9 Showing distribution of family factors

Child factors:

Protected parenting was noted in 20 (35%) of chronic abdominal pain- non organic group, corporal punishment was noted in 40 (70%) , sibling rivalry was noted in 35 (61%) , school refusal was noted in 15 (26%), frequent absenteeism was noted in 19 (33%) , punishment in school was noted in 13 (23%), failure in subject was noted in 15 (26%) children, lack of participation in sports and bullying was noted in 8 (14%) children belonging to non organic group.

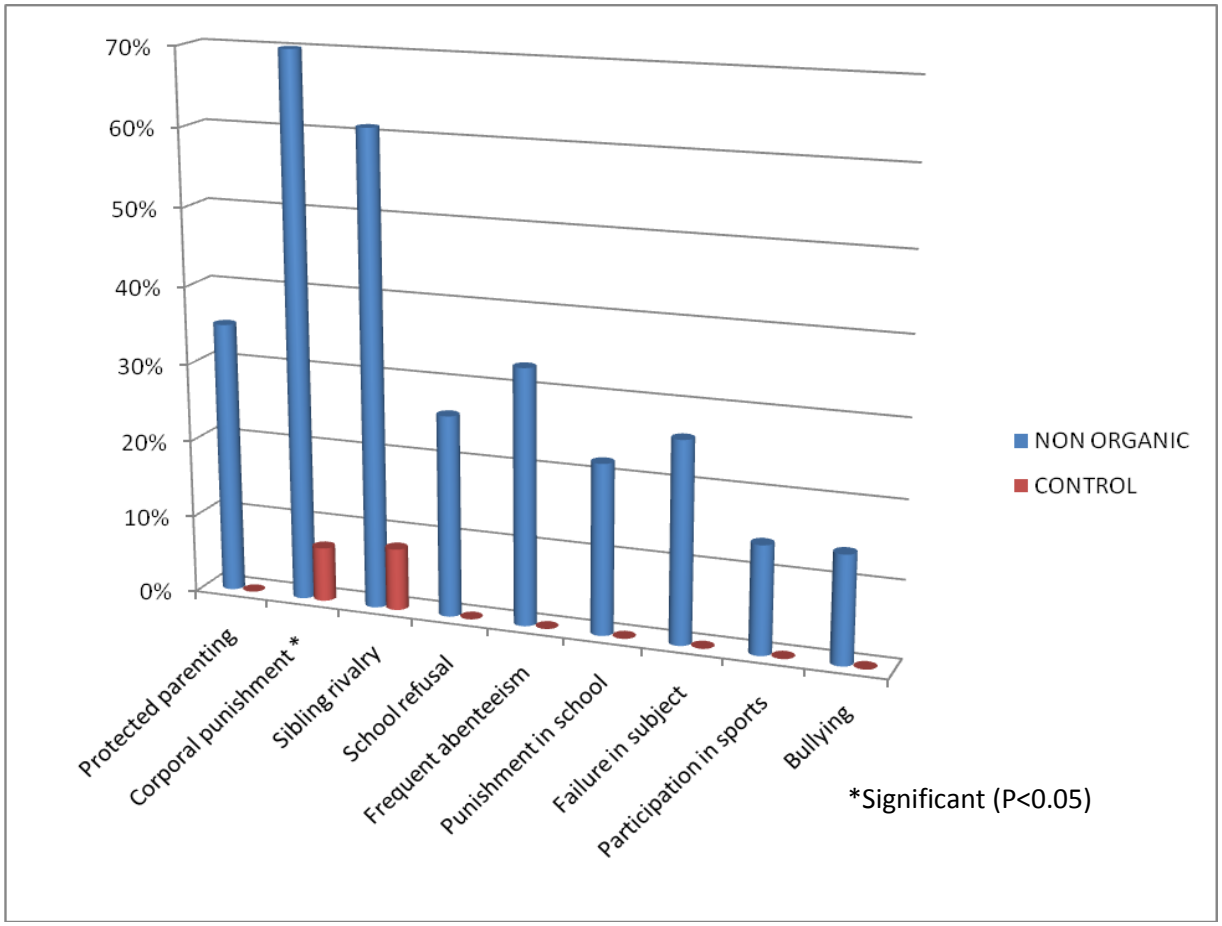

Fig 10. Showing distribution of child factors

Pediatric symptom checklist - 17, Spence children anxiety scale, child depression rating scale scores:

Non organic group had a significantly high score in all scales. The mean score of pediatric symptom checklist - 17 total score was 5.05 in the non organic group (organic- 1.92, control- 1.97). In Spence children anxiety scale, non organic group scored high with a mean total score of 18.58 (organic- 9.08, control- 3.86). Mean separation anxiety score was 5.33(organic- 2.46, control- 1.62), physical injury mean score was 3.6 (control- 1.15, organic- 3.15), generalized anxiety score mean was 3.19 (control- 1.06, organic- 1.31), the mean child depression rating scale score was 17.61 for non organic group (control- 14.79, organic- 16.23).

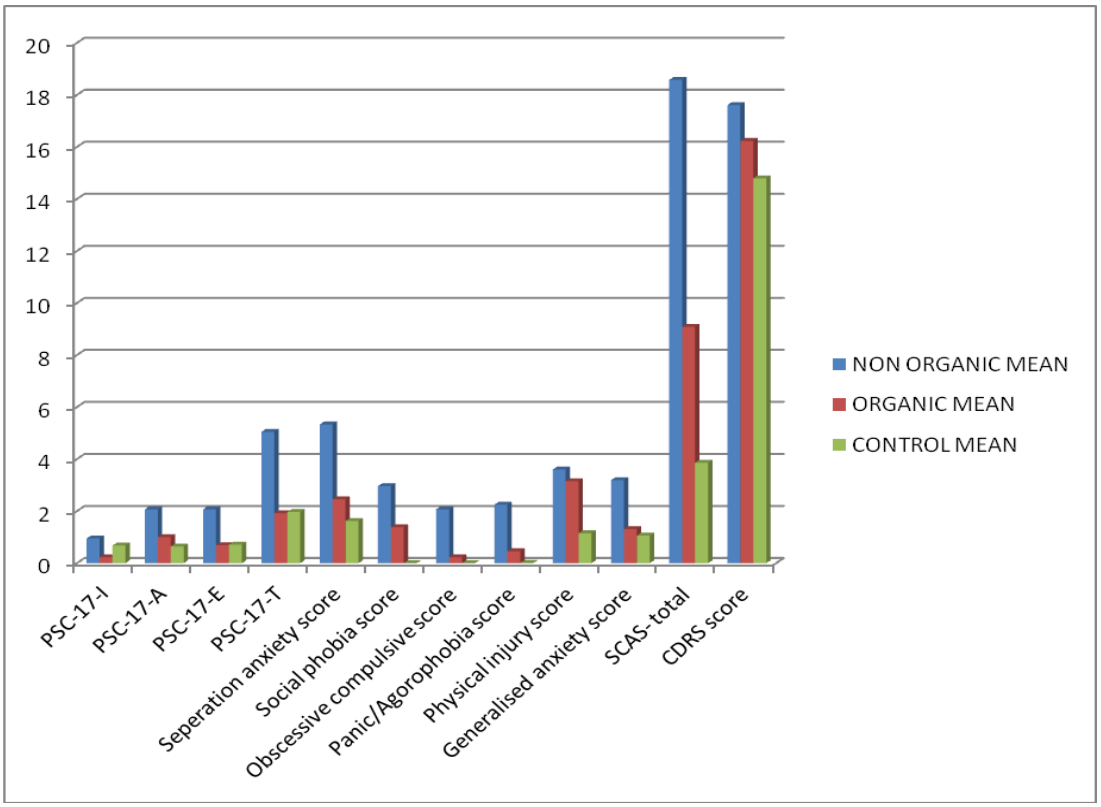

Fig. 11 Showing distribution of mean scores

S.No	Scores	Non Organic		Organic		Control	
		Mean	SD	Mean	SD	Mean	SD
1	Pediatric symptom checklist - 17 -I	0.95	1.381	0.23	0.599	0.68	1.059
2	Pediatric symptom checklist - 17–A	2.07*	2.652	1.00	1.915	0.64	1.066
3	Pediatric symptom checklist - 17 –E	2.07*	2.945	0.69	1.377	0.71	1.144
4	Pediatric symptom checklist - 17 –T	5.05*	5.266	1.92	2.985	1.97	3.09
5	Separation anxiety score	5.33*	3.888	2.40	1.808	1.62	2.765
6	Social phobia score	2.96*	3.576	1.38	2.468	0.00	0.00
7	Obsessive compulsive score	2.07*	2.419	0.23	0.832	0.00	0.00
8	Panic/ agoraphobia score	2.25*	2.281	0.46	0.877	0.01	0.118
9	Physical injury score	3.60*	3.401	3.15	3.625	1.15	1.866
10	Generalized anxiety score	3.19*	3.528	1.31	1.797	1.06	1.799
11	Spence children anxiety scale total score	18.58*	13.550	9.08	8.808	3.86	6.158
12	child depression rating scale score	17.61*	3.468	16.23	2.204	14.79	1.768

Table 5: Showing Mean and SD for scores in all three groups

* Significant when compared with control (sig value < 0.005)

In nonorganic group 18 children (33%) scored more than 26[59] (total score and in child depression rating scale, 12 (22%) scored more than 20[60].

Using multiple logistic regression analysis frequent quarrelling, corporal punishment, and , significant scoring in Spence children anxiety scale-total score and child depression rating scale were found to be significant in non organic pain.

S.No	SignificantFactors	Sig.
1	Frequent quarreling Family	.003
2	Corporal Punishment	.000
3	Spence children anxiety Scale Total score	.012
4	Child depression rating scale Score	.026

Table 7: Showing Significant factors of non organic chronic abdominal pain

DISCUSSION

Chronic abdominal pain is a significant public health problem. Our centre receives at least 15-20 children per week, which constitutes 12.5% of the Gastroenterology Outpatients [53]. These children live in a different psychosocial environment both at school and home, which may play a critical role in the genesis or persistence or aggravation of pain in these children.

This study has revealed 81% (57 children) of children with chronic abdominal pain were non organic and 19% were of organic cause. This is similar to the study done by S.Dutta et. al [7].who have reported 74% of children with chronic abdominal pain were nonorganic. Use of extensive investigation like antibodies for celiac disease, hydrogen breath test and special test for H.pylori may be helpful to diagnose more organic cases.

Our study has revealed that 44 %(25 cases) of children with chronic abdominal pain- non organic were diagnosed as functional abdominal pain as per Rome classification .Devanarayana et.al. reported functional abdominal pain in 71% of case[9]and Boey et.al reported that Irritable Bowel Syndrome constituted 52% of chronic

abdominal pain- non organic[5],but in our study only 14% with non organic group were diagnosed as Irritable Bowel Syndrome.

In our study chronic abdominal pain was found to be more common in the 9 to 12 years (table-). Similar findings were reported by Jacob oster MD et al [40] and John Apley et al [1].

Our study has revealed equal gender distribution of chronic abdominal pain as against female predominance reported by Jacob oster MD et al[40] and John Apley et al[1]. Bharat Balani et.al.[54] reported male predominance in his work.

According to our study, children belonging to all three group viz non organic, organic and control were from same socioeconomic strata and parental education background. Hence there is no selection bias. This may partly be due to the fact that our centre is a tertiary care centre serving as a referral hospital. If a similar study is done in district headquarters hospital, findings may vary.

The abdominal pain around umbilicus and its dull nature in non organic group was found to be statistically significant when compared with organic group thus signifying Apley's law. Similar findings were shown by Robert T Stone et.al[55]who reported periumblical pain in

49% of children with chronic abdominal pain and Deepak Bansal et.al[56] who reported periumblical pain in 80% of children with chronic abdominal pain. However these findings go against S.Dutta et al's study [7] who reported that pain characters by themselves could not differentiate organic from non organic cases.

The other characters like duration of the episodes and illness were not helpful to differentiate organic from non organic pain as suggested by S.Dutta et al[7].However Deepak Bansal et.al[56] and S.Dutta et al[7] concluded that non organic pain was associated with longer mean duration of illness.

Red flag signs are very useful screening tools for organic cause, particularly sleep interference(nocturnal pain), returning to normality in between episode, weight loss, and short stature were statistically significant pointers towards organic cause. These findings were replicated in work of Robert T Stone et.al.[55].

The questionnaire used for assessing psychosocial factors was constructed by a child psychiatrist and all the scales used in study were translated in to local language for standardized administration to reduce observer bias.

In our study no significant statistical differences were found in family type and birth order between three groups and was similar to that of S.Dutta et al [7] study. However Friedman et.al.[58] reported that nearly half of the children with chronic abdominal pain were first or last born.

Frequent quarrelling in family and was found to be statistically associated with non organic pain in our study. These findings were in accordance with that of study done by S.Dutta et al [7].

Although factors like alcohol dependence, tobacco dependence, psychiatric treatment in family, magical belief and religious treatment in family, significant illness and death in family were higher for non organic group, they were statistically non significant.

Presence of a history of chronic abdominal pain in other family members was not found to be statistically significant with our study group.so modeling effect may not play a major role as against the findings of S.Dutta et al [7], and Niyaz et.al[41].

Corporal punishment had statistically association with non organic pain which was also reported by S.Dutta et al.[7].

However sibling rivalry, school punishment, failure in subjects, school absenteeism, protected parenting, bullying and lack of participation were not statistically significant even though they were noted more in non organic group than other groups.

S.Dutta et al[7] agrees with sibling rivalry and failure in subjects but disagrees with school punishment and school absenteeism as assosciated factors. .However Niyaz et.al[41] reported single parent, sibling rivalry, school phobia and nocturnal enuresis were associated with non organic pain.

The study also revealed higher mean scores of pediatric symptom Checklist - 17 total score, separation anxiety , social phobia , obsessive compulsive, panic/ agoraphobia , physical injury , generalized anxiety , spence children anxiety scale total score and child depression rating scale scores in non organic group which were found to be statistically significant when compared with controls. This is in accordance with studies done by John V Campo et al [39] and Garber et al [48]. The Spence children anxiety scale total score and child depression rating scale score were found to have strong association with non organic pain.

In this study prevalence of anxiety was found to be 33% and depression to be 22%. This is lower than what was revealed by John V Campo et al [39] and Garber et al [48]. who reported anxiety in 80% of children and depression in 40% of children with chronic abdominal pain.

Our study has revealed results that are consistent with many similar studies done in other parts of world and in India on chronic abdominal pain and also certain differences.

LIMITATIONS OF STUDY

- As the sample size is small (n=13) for organic children findings cannot be generalized.
- Extensive investigation for H.pylori, antibody for celiac disease and hydrogen breath test would have enhanced the clinical work up.
- Scales which were translated into Tamil language were yet to be validated
- Study was in children belonging to the lower socioeconomic strata only.
- Parents were not assessed for Anxiety, Depression and Somatization disorders.

CONCLUSION

- ✓ Chronic abdominal pain is significantly associated with adverse psychosocial factors in relation with family and child.
- ✓ There is an association between anxiety and depressive disorders and chronic abdominal pain in these children.
- ✓ Structured psychosocial assessment would be helpful in evaluation of these children as biopsycho social factors play a major role in planning an appropriate and adequate intervention.
- ✓ More studies are needed to understand cultural and religious influences and effectiveness of different type's intervention including pharmacotherapy, psychotherapy and behavior modification.

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PROFORMA

CLINICAL & PSYCHOSOCIAL PROFILE OF CHRONIC ABDOMINAL PAIN IN CHILDREN

Demographic Data **Name:**

1. Age :

2. Sex : a. Male b. Female

3. Location : a. Urban b. Rural

4. Academic Grade :

5. Syllabus : a. State board / Metric
   b. CBSE
   c. Anglo Indian

6. Father Education : a. Primary Schooling
   b. Secondary Schooling

c. Higher Secondary

d. College Degree

7. Father Occupation : a. Labor

b. Clerical

c. Professional or Technical

d. Business

8. Mother Education : a. Primary Schooling

b. Secondary Schooling

c. Higher Secondary

d. College Degree

9. Mother Occupation : a. House Wife

b. Working

General History

H/O Abdominal Pain

10. Site : a. Upper abdomen

b.Around umbilicus

c. Lower abdomen

d. Entire abdomen

11. Character of Pain : a. Colicky
b. Dull
c. Burning
d. Stabbing

12. Nature of pain : a. Continuous
b. Intermittent

13. Duration of Each episode: a. Min
b. Hours

14. No. of episodes : a.1to 3 times a month
b. Once a week
c. Several times a week
d. Everyday

15. Duration of Illness : a. 1 Month or less
b. 2 Months
c. 3 Months
d. 4 to 11 months
e. 1 year or longer

16. Pain relieved with defecation:

a. Never
b. Once in a while
c. Sometimes
d. Most of the times
e. Always

17. Pain associated with Recent softening of stool :

a. Never
b. Once in a while
c. Sometimes
d. Most of the times
e. Always

18. Pain associated Recent Hardening of Stool :

a. Never
b. Once in a while
c. Sometimes
d. Most of the times
e. Always

19. Pain associated Recent Increase in frequency of stool :

a. Never
b. Once in a while

c. Sometimes

d. Most of the times

e. Always

20. Pain associated Recent decrease in frequency of stool : a. Never

b. Once in a while

c. Sometimes

d. Most of the times

e. Always

2l. Episode of Severe intense pain around Umbilicus lasting for 1 hour or longer, severe enough to stop activity during last year :

a. Never

b. One time

c.Two time

d. Three to five time

e. Six or more time

22. Did the episode of Severe intense pain : associated with any of the following

a. No appetite	a. Yes	b. No
b. Nausea	a. Yes	b. No
c. Vomiting	a. Yes	b. No
d. Pallor	a. Yes	b. No
e. Headache	a. Yes	b. No
f. Eye sensitive to light	a. Yes	b. No

23. Did the Child returned to normal in between the episodes : a. Yes b. No

24. History of pain in arms, legs or back :
a. Never
b. Once in a while
c. Sometimes
d. Most of the times
e. Always

25. History of fainting or dizziness : a. Never
b. Once in a while
c. Sometimes
d. Most of the times
e. Always

26. Interference with School activities : a. Yes b. No

27. History of difficulty sleeping : a. Never
b. Once in a while
c. Sometimes
d. Most of the times
e. Always

28. Persistent Pain in right upper or right lower quadrant : a. Yes b. No

29. Difficulty in swallowing : a. Yes b. No

30. Aggravated with Food	:	a. Yes	b. No
31. Relived with food	:	a. Yes	b. No
32. Pain that wakes child from sleep	:	a. Yes	b. No
33. H/o Unexplained Fever	:	a. Yes	b. No
34. H/o Persistent/bilious Vomiting	:	a. Yes	b. No
35. H/o Coffee ground vomitus	:	a. Yes	b. No
36. H/o Black coloured stool	:	a. Yes	b. No
37. H/o Frank blood in stool	:	a. Yes	b. No
38. H/O Jaundice	:	a. Yes	b. No
39. H/O Cola coloured or blood in urine	:	a. Yes	b. No
40. H/O Pain during urination	:	a. Yes	b. No
41. H/O increased urine volume	:	a. Yes	b. No
42. H/O Joint Pain	:	a. Yes	b. No
43. H/O Worms in Stool	:	a. Yes	b. No
44. H/O Eating inedible substances	:	a. Yes	b. No
45. H/O Weight Loss	:	a. Yes	b. No
46. H/O Nocturnal diarrhea	:	a. Yes	b. No
47. H/O Nocturnal pain	:	a. Yes	b. No
48. H/o Contact with known tuberculosis	:	a. Yes	b. No

Children

49. H/o drug intake	:	a. Yes	b. No
50. H/o exposure to lead / toxins	:	a. Yes	b. No
51. H/o perianal excoriation	:	a. Yes	b. No
52. H/o chronic diarrhea	:	a. Yes	b. No
53. H/o of persistence of pain inspite of adequate Treatment	:	a. Yes	b. No

PHYSICAL EXAMINATION

54. Anemia	:	a. Yes	b. No
55. Jaundice	:	a. Yes	b. No
56. Clubbing	:	a. Yes	b. No
57. Rash	:	a. Yes	b. No
58. Oral pigmentation	:	a. Yes	b. No
59. Under nutrition (BMI < 5^{th} percentile)	:	a. Yes	b. No
60. Short stature (Ht for age < 3^{rd} percentile)	:	a. Yes	b. No
61. Any Abdominal mass or distention	:	a. Yes	b. No
62. Hepatasplenomegaly	:	a. Yes	b. No
63. Costovertebral angle tenderness	:	a. Yes	b. No
64.Tenderness over spine	:	a. Yes	b. No
64. Perianal abnormalities	:	a. Yes	b. No
65. Oral lesions	:	a. Yes	b. No

66. Joint swelling, redness : a. Yes b. No

Investigation:

67. Hemoglobin (<10) : a. Yes b. No

68. Total Count (>13,500) : a. Yes b. No

69. Eosinophil (>3%) : a. Yes b. No

70. ESR (>20 mm/hr) : a. Yes b. No

71. Serum creatine (>1 mg/dl) : a. Yes b. No

72. Serum ALT (>45 iu/l) : a. Yes b. No

73. Serum Albumin (<3.5 g/dl) : a. Yes b. No

74. Urine Albumin (>2+) : a. Yes b. No

75. Urine culture (>10^5 colony count) : a. Yes b. No

76. Serum amylase (>100 iu/l) : a. Yes b. No

77. Stool for ova/cyst/trophozoites : a. Yes b. No

78.Stool for Occult blood : a. Yes b. No

79. Mantoux positivity (>10mm) : a. Yes b. No

80. Any abnormality in X-ray chest
with abdomen : a. Yes b. No

81. Any abnormality in Ultrasound abdomen : a. Yes b. No

82. Any abnormality in Barium study : a. Yes b. No

83. Any abnormality in Endoscopy : a. Yes b. No

84. STOOL ROUTINE : a. Yes b. No

85. RFT : a. Yes b. No

86. LFT : a. Yes b. No

87. X-RAY CHEST/ABDOMEN * : a. Yes b. No

88. Serum amylase : a. Yes b. No

89. MANTOUX : a. Yes b. No

90. USG – ABDOMEN # : a. Yes b. No

91. BARIUM STUDY $: a. Yes b. No

92. UPPER GASTROINTESTINAL ENDOSCOPY **

: a. Yes b. No

DIAGNOSIS

93. TYPE OF RAP : a. ORAP b. NORAP

TYPE OF ORAP ## ☐

TYPE OF NORAP $$ ☐

ULTRASOUND ABDOMEN#

- Evidence of Hydronephrosis
- Evidence of renal calculi
- Evidence of Gallstone/ Cholecystitis/Liver abscess

- Bowel wall thickening (TB)
- Free/loculated intra abdominal fluid (TB)
- Lymphadenopathy-discreate (>1cm)/matted with caseation/ calcification
- Pulled up ileocaecal rel Gastrointestinalon (pseudo kidney sign)
- Inversion of superior mesenteric artery and vein relationship (Malrotation)
- Altered size of pancreas / altered echogenicity / calcification / dilated ducts / ductal stones / pseudocyst (chronic pancreatitis)

BARIUM STUDY$

- Nodular thickening of mucosal fold (TB)
- Multiple stricture/typical ulcers (TB)
- Thickened ileocaecal value with narrowing of terminal ileum
- Conical caecum (Shrunken & pulled up) (TB)
- Purse string stenoses of ileocaecal value (TB)
- String sigh of kantor/sterlin sign (TB/CROHN'S DISEASE)

- Malposition of caecum/ligament of treitz (malrotation)
- Small ulceration – distributed uniformly about colonic circumference from rectum to proximal colon (UC)
- Featureless colon/reduced in caliber/ shortened/dilated in toxic megacolon (UC)
- Apthous ulceration/thickening nodularity/ strictures/ linear ulcer (cobblestone) skip areas, presence of fistula/sinus tracts (crohn's disease)

ENDOSCOPY**

- Evidence of gastritis
- Evidence of nodularity of gastric antrum
- Evidence of gastric/ duoduenal ulcer
- Prominent rugal fold
- Any other abnormality noted in endoscopy

X-RAY CHEST WITH ABDOMEN*

- Suggestive of tuberculosis (TB) (Hilar lymphadenopathy)
- Presence of gallstone
- Presence of renal calculi
- Loaded faeces
- Evidence of obstruction (TB) (Multiple air fluid level)
- Evidence of ascites/perforation (TB)
- Evidence of calcified nodes (TB)
- Loss of Haustrations (UC)
- Marked dilatation of colon (UC)
- Evidence of intestinal obstruction – double bubble sign (Malrotation)
- Partial Bowel Obstruction/Thumb printing appearance (Crohn's disease)

ORAP##

1. Gastrointestinal causes

    1a. Reflux esophagitis

    1b. Helicobacter pylori gastritis

    1c. Peptic ulcer

    1d. Lactose intolerance

    1e. Giardiasis

    1f. Inflammatory bowel disease

    1g. Abdominal tuberculosis

2. Liver, spleen, and biliary tract disorders

    2a. Hepatitis

    2b. Liver abscess

    2c. Cholelithiasis

    2d. Recurrent or chronic pancreatitis

3. Genitourinary causes

    3a. Urinary tract infection

    3b. Urinary calculi

    3c. Hydronephrosis

3d. Dysmenorrhea

3e. Pelvic inflammatory disease

4. Surgical causes

4a. Malrotation with intermittent volvulus

4b. Chronic appendicitis

5. Miscellaneous

5a. Infantile colic,

5b. lead poisoning

5c. familial Mediterranean fever

5d. Vasculitis

5e. angioneurotic edema

5f. acute intermittent porphyria

NORAP – (ROME III criteria)$$

6a. Functional dyspepsia

6b. Irritable bowel syndrome

6c. Abdominal migraine

6d. Childhood functional abdominal pain

6e. Childhood functional abdominal pain syndrome

Psychosocial Assessment

Family

94. Type of Family	:	a. Joint Family b. Nuclear Family	
95. Birth Order	:	☐	
96. Both Parents Alive	:	a. Yes	b. No
97. Any significant illness in family	:	a. Yes	b. No
98. Any death in family in last one year	:	a. Yes	b. No
99. Chronic abdominal pain in family	:	a. Yes	b. No
100. H/o Marital disharmony in Family			
Frequent quarreling in Family	:	a. Yes	b. No
Family separation	:	a. Yes	b. No
Divorce in Family	:	a. Yes	b. No
101. H/O Psychiatric treatment in Family	:	a. Yes	b. No
102. H/O Attempted Suicide in Family	:	a. Yes	b. No
103. H/O Completed Suicide in Family	:	a. Yes	b. No
104. H/O Possession Attack in Family	:	a. Yes	b. No

105. H/O Magical belief / Religious

Treatment in Family : a. Yes b. No

106. H/O Alcohol Dependence in Family : a. Yes b. No

H/O of tobacco dependence

(hans, manickchand, etc.) : a. Yes b. No

Child

107. H/O Protected Parenting : a. Yes b. No

108. H/O Corporal Punishment : a. Yes b. No

109. H/O Sibling Rivalry : a. Yes b. No

110. H/O School refusal : a. Yes b. No

111. H/O Frequent Absenteeism : a. Yes b. No

112. H/O Frequent Punishment : a. Yes b. No

113. H/O Failure in any subject : a. Yes b. No

114. H/O Lack of participation in sports : a. Yes b. No

115. H/o bullying : a. Yes b. No

116. PSC17-I – Score

117. PSC17-A – Score

118. PSC 17-E – Score

119. PSC 17- Total Score

120. Separation anxiety – Score

121. Social phobia – score

122. Obsessive compulsive – score

123. Panic/agoraphobia – score

124. Physical injury fears – score

125. Generalized anxiety – score

126. Spence Children Anxiety Scale- Total score

127. Child Depression Rating Scale Score

SPENCE CHILDREN'S ANXIETY SCALE - Tamil Version

Done in ICH

எண்	விபரங்கள்	எப்போதும் இல்லை	எப்போதாவது	அடிக்கடி	எப்போதும்
1.	நான் கவலைப்படுகிறேன்.				
2.	எனக்கு இருட்டை பார்த்தால் பயம்.				
3.	பிரச்சனைகளை சந்திக்கும்போது, என் அடிவயிற்றில் ஒருவித உணர்வு உண்டாகிறது.				
4.	நான் பயப்படுகிறேன்.				
5.	வீட்டில் தனியாக இருக்கும்போது பயமாக உள்ளது.				
6.	எனக்கு தேர்வை (பரீட்சை) சந்திக்கும்போது பயம் உண்டாகிறது.				
7.	எனக்கு பொது கழிப்பிடத்தை பயன்படுத்த பயமாக/ தயக்கமாக உள்ளது.				
8.	எனக்கு பெற்றோரை விட்டு பிரிந்து இருப்பதற்கு கவலையாக உள்ளது.				
9.	எனக்கு பொது இடங்களில், மற்றவர்கள் பார்க்கையில் ஏதேனும் தவறு செய்து சொதப்பி விடுவேனோ என்ற பயம் உண்டாகிறது.				
10.	எனக்கு பள்ளி சம்பந்தப்பட்ட / தொடர்பான வேலைகளில் சரியாக செய்ய முடியாமல் போய்விடுமோ என்ற பயம் உண்டாகிறது.				
11.	எனக்கு, என் சக மாணவர்களை (Classmates) ஒப்பிடுகையில் (Compare) பெருமை அதிகம்.				
12.	எனது குடும்பத்தினருக்கு ஏதேனும் விபத்து ஏற்பட்டு விடுமோ அல்லது நோய் ஏற்பட்டு விடுமோ என்ற பயம் உண்டாகிறது.				
13.	எனக்கு காரணமே இல்லாமல் திடீரென்று மூச்சடைப்பு,மூச்சுத்திணறல் உண்டாகிறது.				
14.	நான் செய்த வேலைகளை அடிக்கடி சரிபார்க்கிறேன்.				
15.	நான் தூக்கம் வராமல் கஷ்டப்படுகிறேன். பயம் ஏற்படுகிறது.				

எண்	விபரங்கள்	எப்போதும் இல்லை	எப்போதாவது	அடிக்கடி	எப்போதும்
16.	நான் காலையில் பள்ளி செல்வதற்கு தயங்குகிறேன், பயமாக உள்ளது, அழுகை உண்டாகிறது.				
17.	நான் நன்றாக விளையாடுகிறேன்.				
18.	எனக்கு நாயை கண்டால் பயம் உண்டாகிறது.				
19.	எனக்கு தேவையில்லாத எண்ணங்கள் / சிந்தனைகள் உண்டாகின்றன. அதை நிறுத்த முடியாமல் தடுமாறுகிறேன்.				
20.	பிரச்சினைகளை சந்திக்கும்போது நெஞ்சு படபடப்பு ஏற்படுகிறது.				
21.	எனக்கு திடீரென்று, காரணமேயில்லாமல் நடுக்கம் உண்டாகிறது.				
22.	எனக்கு ஏதாவது கெட்டது நடந்துவிடுமோ என்ற பயம் ஏற்படுகிறது.				
23.	எனக்கு டாக்டர்-ஐ பார்க்க செல்லவேண்டும் என்றால் பயம் உண்டாகிறது.				
24.	பிரச்சனைகளை சந்திக்கும்போது நடுக்கம் உண்டாகிறது.				
25.	நான் உயரமான இடங்களில் (அ) லிப்ட்-ல் உள்ளபோது பயப்படுகிறேன்.				
26.	நான் நல்ல மாணவன் / மாணவி				
27.	நான் கெட்ட செயல்கள் நடைபெறாமல் இருப்பதற்காக சில சிந்தனைகளை உண்டாக்குகிறேன். (எண்ணுதல், ஓம் என்று சொல்லுதல்)				
28.	எனக்கு பயணம் செய்வதென்றால் பயம் உண்டாகிறது.				
29.	எனக்கு மற்றவர்கள் என்னைபற்றி சிந்திப்பார்களோ, பேசுவார்களோ என்ற எண்ணம் உண்டாகிறது.				
30.	நான் கும்பலை, மக்கள் நிறைய உள்ள இடங்களை தவிர்க்க விரும்புகிறேன்.				
31.	நான் சந்தோஷமாக உள்ளேன்.				
32.	எனக்கு காரணமே இல்லாமல் பயம் உண்டாகிறது.				

எண்	விபரங்கள்	எப்போதும் இல்லை	எப்போதாவது	அடிக்கடி	எப்போதும்
33.	எனக்கு பூச்சிகள், சிலந்தி என்றாலே பயம் ஏற்படுகிறது.				
34.	எனக்கு திடீரென்று கிறுகிறுப்பு அல்லது மயக்கம் உண்டாகிறது.				
35.	எனக்கு வகுப்பறையில் மற்றவர்கள் முன் பேசுவதற்கு தயக்கமாக உள்ளது.				
36.	என் இருதயம் திடீரென்று படபடக்கிறது.				
37.	எனக்கு திடீரென்று பயம் உண்டாவதை நினைத்துக் கவலைப்படுகிறேன்.				
38.	எனக்கு என்னை பிடித்திருக்கிறது.				
39.	எனக்கு மிக சிறிய இடத்தில் இருப்பதற்கு பயம் உண்டாகிறது. (அடைபட்டு விடுவோமோ என்ற பயம்)				
40.	எனக்கு ஒரே நாளில் வேலையை முடித்துவிட வேண்டும் என்ற உணர்வு உண்டாகிறது.				
41.	எனக்கு தேவையில்லாத எண்ணங்கள், உருவங்கள் மனதில் உண்டாகின்றன.				
42.	கெட்ட செயல்கள் நடைபெறாமல் இருக்க, ஏதாவது உடனடியாக செய்யவேண்டும் என்று தோன்றுகிறது.				
43.	எனது பள்ளி வேலைகளை நினைக்கும்போது பெருமையாக உள்ளது.				
44.	வேறு ஏதேனும் உங்களுக்கு பயத்தை உண்டு பண்ணுகிறதா?				

Pediatric Symptom Checklist - 17 - Tamil Version

Done in ICH

எண்	விபரங்கள்	எப்போதும் இல்லை	எப்போதாவது	அடிக்கடி
1.	நிலைகொள்ளாமல் இருத்தல் (கை கால்கள் தொடர்ந்து நெளிதல்)			
2.	சோர்வுடன், கவலையுடன் காணப்படுதல்.			
3.	பகல் கனவு காணுதல் (சிந்தனைமயமாக இருத்தல்)			
4.	பகிர்ந்து கொள்ளும் தன்மை இல்லாதிருத்தல்			
5.	மற்றவர்களில் உணர்வுகளை புரிந்து கொள்ளாதிருத்தல்			
6.	நம்பிக்கை இல்லாமல் இருத்தல்			
7.	தொடர்ச்சியாக கவனம் செலுத்துவதில் சிரமம்.			
8.	சகமாணவர்களுடன் சண்டையிடுதல்			
9.	தனிமையில் (தனித்து) இருத்தல்			
10.	தன் தவறுகளுக்கு மற்றவர்களை குறை கூறுதல்			
11.	விளையாட்டு, பொழுது போக்குகளில் ஆர்வம் இன்மை			
12.	விதிகளை மதிக்காத தன்மை			
13.	காலில் வெண்ணீர் ஊற்றியது போல நகர்ந்து கொண்டே இருத்தல்.			
14.	மற்றவர்களை கேலி, கிண்டல் செய்தல்.			
15.	அடிக்கடி கவலைப்படுதல்			
16.	மற்றவர்கள் பொருட்களை எடுத்துக் கொள்ளுதல்			
17.	கவனம் எளிதில் சிதறிப்போகுதல்			

பகுதி-3 குழந்தைகளின் மனச்சோர்வு அளவு குறியீடு
(CHILDREN'S DEPRESSION RATING SCALE)

1. சோகமான மனநிலை (DEPRESED MOOD)

0 தகவல் இல்லை

1 உறுதியாக சோகம் இல்லை

2 தெரியவில்லை

3 லேசகா

4 மிதமாக

5 தீவிரமாக

2. அழுதல் (WEEPING)

0 தகவல் இல்லை

1 சாதாரணமாக உள்ளது

2 மற்ற குழந்தைகளை விட அதிகமாக

3 அடிக்கடி அழுதல்

3. சுயமரியாதை (SELF ESTEEM)

0 தகவல் இலலை

1 தன்னைப்பற்றி உயர்வாக நினைத்தல்

2 தாழ்வுமனப்பான்மை தெரியவில்லை

3 தன்னைப்பற்றி உயர்வாகவும், தாழ்வாகவும் நினைத்தல்

4 தாழ்வுமனப்பற்றி குறைக்கூறுதல்

5 தாழ்வு மனப்பான்மை அதிகம்

4. ஆரோக்கியமற்ற சிந்தனை (MORBID IDEATION)

0 தகவல் இல்லை

1 தெரியப்படுத்தவில்லை

2 அரிதாக, சமீபகால சம்பவங்களின் அடிப்படையில்

3அடிக்கடி (குழந்தையே வெளிப்படுத்துகிறது)

4 இறப்புப்பற்றிய சிந்தனை

5. தற்கொலை சிந்தனைகள் (SUICIDAL IDEATION)

0 தகவல் இல்லை

1 தெரியப்படுத்தவில்லை

2 கோபமாக உள்ளபோது வெளிப்படுத்துதல்

3 அடிக்கடி

4 அடிக்கடி தற்கொலை முறைகள் பற்றி பேசுதல்

5 சமீபத்தில் தற்கொலை முயற்சி செய்தது

6. எரிச்சலடைதல் (IRRITABILITY)

0 தகவல் இல்லை

1 சாதாரணமாக

2 எப்போதாவது

3 எத்தனை முறை

4 அடிக்கடி

5 தொடர்ச்சியாக

7. பள்ளிப்பாட வேலைகள் (School Work)

0 தகவல் இல்லை

1 சாதரணமாக

2 திறமைக்கேற்ற அளவு செயல்படவில்லை

3 வேலையில் தொய்வு

4 செயல்படவில்லை

8. மகிழ்வுறும் திறன் (CAPACITY FOR FUN)

0 தகவல் இல்லை

1 வயதுக்கேற்ற மகிழ்வு

2 உற்சாகம் குறைவு

3 எளிதில் சோர்வு அடைதல்

4 ஆர்வம் இல்லாமல் செயல்படுதல்

5 எந்த வேலையிலும் ஈடுபாடு இல்லை

9. சமூக ஈடுபாடு குறைவு (SOCIAL WHTHDRAWL)

0 தகவல் இல்லை

1 மற்ற குழந்தைகளுடன் நன்றாக ஈடுபடுதல்

2 ஓரிரண்டு குழந்தையுடன் மட்டும்

3 மற்ற குழந்தையுடன் மனதளவில் ஈடுபாடு இல்லாமல் படுதல், விளையாட்டுகளை வேடிக்கைப்பார்த்தல்

4 விளையாட்டுகளை தவிர்க்கிறது

5 நண்பர்கள் இல்லை

10. கருத்து வெளிபாடு (EXPRESSIVE COMMUNICATION)

0 தகவல் இல்லை

1 சாதரணமாக

2 குறைவாக உள்ளது

3 மிகக்குறைவாக உள்ளது

11. தூக்கம் (SLEEP)

0 தகவல் இல்லை

1 தொந்தரவு இல்லை

2 லேசான தூக்க குறைபாடு

3 மிக அதிகமான தூக்க குறைபாடு

12. சாப்பிடுதல் (DISTURBANCE OF EATING PATTERN)

0 தகவல் இல்லை

1 தொந்தரவு இல்லை

2 குறைவாக சாப்பிடுதல்

3 மிதமாக சாப்பிடுதல்

13. உடல் ரீதியான தொந்தரவுகள் (FREQUENT PHYSICAL COMPLAINTS)

0 தகவல் இல்லை

1 சாதரணமாக

2 எப்போதாவது

3 அடிக்கடி

4 எப்பொழுதும்

14. உடல் சோர்வு (GENERAL SOMATIC)

0 தகவல் இல்லை

1 சாதரணமாக

2 எப்போதாவது

3 அடிக்கடி

15 சுறுசுறுப்பு (ACTIVITY LEVEL)

0 தகவல் இல்லை

1 சாதரணமாக உள்ளது

2 மிதமாக உள்ளது

3 அதிகமாக குறைந்துள்ளது விளையாடும்போது, நடக்கும்போது

INFORMATION TO PARTICIPANTS

You are invited to take part in this study. The information is this document is meant to help you decide whether or not to take part. Please feel free to ask if you have any queries or concerns.

You are being asked to participate in this study being conducted in ICH.

The purpose of the study is to identify the Psycho Social Factors involved in children with recurrent abdominal pain. This study also identifies the prevalence of Anxiety and Depression in these children.

Children's participating in this study is divided into two group viz Case and Control. Both the group will be subjected to detailed structured Psycho Social Assessment using standardized questionnaire. Children in case group will be subjected to necessary investigation (Blood, Urine, X-ray, Scan, Scopy).

We have obtained permission from the Institutional ethics Committee.

You may refuse to participate or withdraw from the study at anytime. In both cases, your child will be treated in the usual manner is the hospital.

There is no harm to the patient is this study.

CONFIDENTIALITY:

The data collected from the study will be used for the purpose of the study only. The results of the study are to be published. Personal information of the children participating in the study will be kept confidential. There will not be any disclosure about your child's information without your permission.

SUBJECT RIGHTS:

I understood that if I wish further information regarding my child's rights as a research subject, I may contact appropriate guide persons for this study in ICH where the study is taking place.

Signature of investigator Signature of Parent / Guardian

Date

INFORMED CONSENT FORM

TITLE OF STUDY:

Name: Date:

Age: In patient No:

Sex: Research Roll No:

I have been fully informed about the study and the benefits to my child and possible harm that can happen.

This authorization is valid only for this study.

“I have understood and received copy of the consent form” I agree for my child’s participation in this study.

Signature / Thumb Print of Parent / Guardian:

Signature of the investigator

Witness Signature

Date:

Principle investigator:

Address:

Phone:

தகவல் அளிக்கப்பட்ட ஒப்புதல் படிவம்

எனது குழந்தைக்கு வயிற்று வலி வியாதி இருக்கிறது என்று மருத்துவர் மூலம் தெரிவிக்கப்பட்டது.

இந்த ஆய்வு பற்றி எனக்கு விளக்கமாக எனது தாய்மொழியில் தெரிவிக்கப்பட்டது. இந்த ஆய்வில் பங்கெடுத்துக் கொள்வதால் குழந்தைக்கு ஏற்படக்கூடிய அபாயங்கள் மற்றும் நன்மைகள் பற்றி எனக்கு விவரமாக தெரிவிக்கப்பட்டது. இந்த ஆய்வில் எனது குழந்தை பங்கெடுத்துக் கொள்ள முழு மனதுடன் சம்மதிக்கிறேன். கேள்விகள் கேட்பதற்கு எனக்கு வாய்ப்பளிக்கப்பட்டது.

இந்த ஆய்விலிருந்து கிடைக்கும் முடிவுகளை பயன்படுத்துபவரை கட்டுப்படுத்தாமலிருக்க நான் சம்மதிக்கிறேன்.

குழந்தையின் பெயர் -

குழந்தையின் பெற்றோர் / கண்காணிப்பாளர் பெயர் -

குழந்தையின் பெற்றோர் / கண்காணிப்பாளர் கையெழுத்து -

தேதி -

எழுதப்படிக்கத் தெரியாத பெற்றோர் / கண்காணிப்பாளர் கைவிரல் ரேகை -

சாட்சியின் பெயர் -

சாட்சியின் கையெழுத்து -

தேதி -

ஆய்வாளர் / ஆய்வு மருத்துவர் பெயர்

-

ஆய்வாளர் / ஆய்வு மருத்துவர் கையெழுத்து -

தேதி -